Gold Spot on Photographic Plates

Since the alarming discovery of 'gold spot' degradation of plates in the late 1970s, the spectre of the world's plate archives slowly self-destructing has haunted astronomers and archivists alike. Although the effect was soon dubbed 'gold spot disease' it was in no way infectious and it was soon realised that it was only seen on the fine-grain (mostly IIIa- type) emulsions, and once infected, the initial 'rash' was slow to spread to the rest of the plate. These IIIa emulsions are unusual in being pure silver bromide; most normal negative materials contain some silver iodide.

Curiously, the plates of some institutions hardly suffered at all from gold spot, among them substantial collections at ESO and the AAT, though many plates from the UK Schmidt were affected. Even when new processing recommendations from Eastman Kodak were followed some UKST plates still deteriorated, though post-processing toning of the plates with selenium toner largely (though not completely) prevented further degradation.

The new, anti-gold spot recommendations from Kodak included a change from normal to rapid fixer and the elimination of Hypo-Clear from the processing cycle. Curiously, the use of iodide as a preventative was not reported as useful in the series of publications from Kodak where the gold spot problem was addressed, despite the fact that the addition of iodide ion to the fixer was found to be an excellent preventative when gold spot was found on (bromide emulsion) microfilms in the 1960s.

It now seems that those observatories that fix iodide-containing plates such as IIa or 098-04 in the same fixer as the IIIa types are those where gold spot is relatively rare and conversely, where fresh fixer is used, or cross-contamination is deliberately avoided, gold spot thrives. A test of this is now being conducted at the UK Schmidt, where two fixer lines are being used in parallel, one with and one without the addition of 2 grams per litre of potassium iodide. The long induction period of gold spot prevents instant appraisal of the results (but see next news note) but we will keep Working Group members informed of developments, or (we hope) the lack of them.

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Rapid Test to Evaluate Resistance to Gold Spot

In *J. Imaging Tech.*, **17**, 91 (1991), Adelstein et al. describe a method of testing the resistance of processed photographic emulsions to gold spot, (or redox blemishes as they are perhaps more usefully known). In essence, they have improved on earlier methods of exposing processed materials to hydrogen peroxide vapour. Most laboratories concerned with archival permanence of photographic materials use some variant of this test but the results are not reproducible.

The paper discusses the reasons for this and goes on to describe a simple piece of apparatus that seems to eliminate some of the variables that result in erratic test results. In essence this consists of a desiccator fitted with a fan that is used in the early part of the test to ensure good circulation of the vapour, careful specimen placement in the test vessel and tight specification of peroxide application and humidity control. Samples can be reliably evaluated in a test cycle that runs for 18 hours, using equipment and conditions that most astronomical institutions should be able to duplicate fairly well.

A more recent issue of *J. Imaging Tech.* **36**, No. 1, is an issue featuring the conservation of images. Papers include work on the degradation of polyester magnetic (video-tape) materials as well as the more conventional photographic products and laser discs.

Reported by D. Malin